What is claimed is:

1. An acoustic coding apparatus comprising:

a downsampling section that decreases a sampling rate of an input signal;

a base layer coding section that encodes the input signal with the decreased sampling rate in predetermined base frame units;

a decoding section that decodes the coded input signal to obtain a decoded signal;

an upsampling section that increases the sampling rate of the decoded signal to the same rate as the original sampling rate;

a subtraction section that obtains a difference signal between the input signal when the signal is input and the decoded signal with the increased sampling rate ; and

an enhancement layer coding section that encodes the difference signal in units of an enhancement frame shorter than that of the base frame.

2. The acoustic coding apparatus according to claim 1, further comprising a frame division section that divides the difference signal in base frame units into enhancement frame units, wherein the enhancement layer coding section encodes the divided difference signal.

3. The acoustic coding apparatus according to claim 1, wherein the base layer coding section encodes the input

signal using a code excited linear prediction coding.

4. The acoustic coding apparatus according to claim 1, wherein the enhancement layer coding section transforms the difference signal from a time domain to a frequency domain and encodes the transformed difference signal.

5. The acoustic coding apparatus according to claim 4, wherein the enhancement layer coding section transforms the difference signal from a time domain to a frequency domain using a modified discrete cosine transform.

6. The acoustic coding apparatus according to claim 4, wherein the enhancement layer coding section encodes only a predetermined band of the difference signal transformed to a frequency domain.

7. The acoustic coding apparatus according to claim 4, further comprising a perceptual masking section that calculates perceptual masking expressing an amplitude value which does not affect to auditory perception, wherein the enhancement layer coding section does not regard signals in the perceptual masking as coding targets.

8. The acoustic coding apparatus according to claim 7, wherein the enhancement layer coding section calculates a difference between perceptual masking and a residual

signal, regards a residual signal for which the difference is relatively large as a coding target and encodes the positions in a time domain and frequency domain in which the residual signal exists.

9. The acoustic coding apparatus according to claim 8, wherein the enhancement layer coding section regards plural domains in one or both of the time domain and frequency domain as one group, calculates a difference between the perceptual masking and residual signal in units of the group and encodes only the residual signal included in the group for which this difference is relatively large.

10. An acoustic decoding apparatus comprising:

a base layer decoding section that decodes a first coded code obtained by coding an input signal at a coding side in predetermined base frame units to obtain a first decoded signal;

an enhancement layer decoding section that decodes a second coded code obtained by coding a residual signal between the input signal and the signal obtained by decoding the first coded code at the coding side in units of an enhancement frame having a shorter time length than that of the base frame to obtain a second decoded signal;

an upsampling section that increases the sampling rate of the first decoded signal to the same sampling rate as the sampling rate of the second decoded signal;

and

an addition section that adds the second decoded signal to the first decoded signal with the increased sampling rate .

11. The acoustic decoding apparatus according to claim 10, wherein the base layer decoding section decodes the first coded code using a decoding process of a code excited linear prediction coding.

12. The acoustic decoding apparatus according to claim 10, wherein the enhancement layer decoding section transforms the signal obtained by decoding the second coded code from the frequency domain to time domain.

13. The acoustic decoding apparatus according to claim 12, further comprising an overlapping addition section that overlaps frame sections obtained by coding the second decoded signals with each other at the same timing,

wherein the enhancement layer decoding section transforms the signal obtained by decoding the second coded code using an inverse modified discrete cosine transform from the frequency domain to time domain to thereby decode the second decoded signals and outputs the decoded signals to the addition section, and

the addition section adds the second decoded signals overlapped by the overlapping section to the first decoded signal.

14. The acoustic decoding apparatus according to claim 12, wherein the enhancement layer decoding section decodes the information on the time domain and frequency domain in which the residual signal exists from the second coded code and decodes the time domain and frequency domain in which the residual signal exists.

15. The acoustic decoding apparatus according to claim 14, wherein the enhancement layer decoding section regards plural domains in one or both of the time domain and frequency domain as one group and decodes the residual signal included in the group to be decoded.

16. An acoustic signal transmission apparatus comprising:

an acoustic input section that converts an acoustic signal to an electric signal;

an A/D conversion section that converts the signal output from this acoustic input section to a digital signal;

the acoustic coding apparatus according to claim 1 that encodes the digital signal output from this A/D conversion section;

an RF modulation section that modulates the coded code output from this coding apparatus to a signal at a radio frequency; and

a transmission antenna that converts the signal

output from this RF modulation section to a radio wave and transmits the signal.

17. An acoustic signal reception apparatus comprising:

a reception antenna that receives a radio wave;

an RF demodulation section that demodulates the signal received by this reception antenna;

the acoustic decoding apparatus according to claim 10 that decodes the information obtained by this RF demodulation section;

a D/A conversion section that converts the signal output from this decoding apparatus to an analog signal; and

an acoustic output section that converts the electric signal output from this D/A conversion section to an acoustic signal.

18. A communication terminal apparatus comprising at least one of the acoustic signal transmission apparatus according to claim 16 and the acoustic signal reception apparatus according to claim 17.

19. A base station apparatus comprising at least one of the acoustic signal transmission apparatus according to claim 16 and the acoustic signal reception apparatus according to claim 17.

20. An acoustic coding method comprising the steps of:

on a coding side, generating a first coded code by coding an input signal in predetermined base frame units;

decoding the coded input signal to obtain a first decoded signal;

obtaining a difference signal between the input signal and the decoded signal; and

coding the difference signal in units of an enhancement frame having a shorter time length than that of the base frame to generate a second coded code, and

on a decoding side, decoding the first coded code to obtain a second decoded signal;

decoding the second coded code to obtain a third decoded signal; and

adding the second decoded signal to the third decoded signal.